The Open Court.

A WEEKLY JOURNAL

Devoted to the Work of Conciliating Religion with Science.

Entered at the Chicago Post-Office as Second-Class Matter.

OFFICE, 169–175 LA SALLE STREET.

No. 76. Vol. II.—50. CHICAGO, FEBRUARY 7, 1889. Two Dollars per Year. Single Copies, 10 cts.

CONTENTS:

TRUTH AND FICTION. The Element of Imagination in the Observation of Meteorites. Dr. M. WILHELM MEYER, of Berlin..... 1451

JIM THE INVENTOR. WHEELBARROW..... 1455

AXIOMS THE BASIS OF MATHEMATICS. Dr. EDWARD BROOKS, of Philadelphia..... 1456

COGNITION, KNOWLEDGE, AND TRUTH. EDITOR.. 1458

NOTES.

POETRY.

Byron. LOUIS BELROSE, JR.

Cervantes. LOUIS BELROSE, JR.

Shelley. WILLIAM BRUNTON..... 1460

FICTION.

The Lost Manuscript. (*Continued.*) GUSTAV FREYTAG. 1460

CORRESPONDENCE.

Mrs. M. M. E. on Marriage Contracts. Prof. E. D. COPE.

NEW PUBLICATION.

THE

Psychic Life of Micro-Organisms

A STUDY IN EXPERIMENTAL PSYCHOLOGY

By ALFRED BINET.

Translated from the French with the Sanction of the Author. Treating of the following subjects:

1. *The Psychology of the Cell*—Introductory.
2. *The Structural and Physiological Character of Proto-Organisms: the Motory and Sensory Organs.*
3. *The Psychology of Nutrition: Holophytic, Saprophytic, and Animal Nutrition: Predatory Habits of Certain Animalcula.*
4. *Colonies of Unicellular Organisms.*
5. *Fecundation of Proto-Organisms.*
6. *Fecundation of Higher Animals and Plants.*
7. *The Physiological Function of the Nucleus.*
8. *Correspondence between Alfred Binet and Ch. Richet (Professor of Physiology in the Faculty of Medicine at Paris) respecting Cellular Psychology.*

The monograph of M. Binet is an important contribution to comparative psychology. It presents the results of the most recent researches, and draws from sources inaccessible to the majority of scientific readers—the reports and publications of foreign societies. Here may be instanced, apart from the author's original investigations, the researches of *Balbiani, Claparède* and *Lachmann, Maupas, Ribot, Haeckel, Engelmann, Espinas, Pouchet, Weber, Pfeffer, Kent, Dujardin, Gruber, Nussbaum, Bütschli, Lieberkühn.*

In a preface written especially for the American edition, M. *Binet* confutes the theory of the English scientist, Mr. *G. J. Romanes*, that the first appearance of the various psychical and intellectual faculties is assignable to different stages in the scale of zoölogical development.

16 mo, 135 pages. Cloth, 75 Cts, Paper, 50 Cts.

OPEN COURT PUBLISHING CO.,

169-175 LA SALLE STREET,

P. O. Drawer F, Chicago, Illinois.

The Open Court Clubbing Rates.

The subjoined rates are offered to all who wish to subscribe for THE OPEN COURT and any one of the magazines in the following list. If more than one be desired, they may be obtained through our office at the price stated in the first column, allowing a discount of 10 per cent on all orders amounting to $10.00 and over. Each periodical sent with THE OPEN COURT for the price stated in the second column. Money must accompany all orders.

	Subscription for one year	With The Open Court
Architects and Builders Edition of Scientific American	2.50	4.00
Art Amateur	$4.00	$5.25
Atlantic Monthly	4.00	5.20
Century Magazine	4.00	5.50
Cottage Hearth The	1.50	2.50
Forum The (New Subscriptions)	5.00	5.00
Forum The (Old Subscriptions)	5.00	6.00
Harper's Magazine	4.00	5.00
Harper's Weekly	4.00	5.20
Lippincott's Magazine	3.00	4.25
Macmillan's Magazine	3.00	4.50
Magazine of American History	5.00	6.00
Microscope The	1.00	2.75
Nation The	3.00	4.70
Nature (New York and London)	6.00	7.15
North American Review	5.00	6.00
Popular Science Monthly	5.00	6.00
Science	3.50	4.80
Scientific American	3.00	4.50
Scientific American Supplement	5.00	6.00
Scribner's Magazine	3.00	4.40
St. Nicholas	3.00	4.50
Wide Awake	2.40	4.00

KOELLING & KLAPPENBACH,

IMPORTERS OF

FOREIGN BOOKS AND PERIODICALS,

48 DEARBORN STREET,

CHICAGO, ILL.

AGENTS! double their money selling our Brass Finished Corrugated

Reflecting Safety Lamp.

Can be sold in every family. Gives more light than three ordinary lamps. Full sized Lamp sent by Express for thirty cents. We also have the best selling Coffee Pot in the United States. Send for illustrated circulars to

FORSHEE & McMAKIN, Cincinnati, Ohio.

Henry J. Ennis,

Attorney and Counsellor in Patent Cases.

Rejected and Complicated Cases a Specialty.

Office: Lenox Building,

WASHINGTON, D. C.

(Opposite the U. S. Patent Office.) P. O. Box 442. Patent Business Exclusively.

AGENTS! can make $5.00 per Day profit selling our Albums. We beat the World for low prices.

A Red Plush Photograph Album,

8½ x 10½. Embossed padded sides, gold edges, extension clasp, holding 32 pages of Cabinet and Card pictures, sent for $1.00, retails for $2.25; bound also in Japanese Morocco. Illustrated circulars FREE of the above and FINER STYLES OF

FORSHEE & McMAKIN, **ALBUMS.**

CINCINNATI, OHIO.

THE OPEN COURT.

PUBLISHED EVERY THURSDAY BY

THE OPEN COURT PUBLISHING CO.

EDWARD C. HEGELER, PRESIDENT. DR. PAUL CARUS, EDITOR.

THE READER will find in THE OPEN COURT an earnest, and, as we believe, a successful effort to conciliate Religion with Science. The work is done with due reverence for the past and with full confidence in a higher future.

THE OPEN COURT unites the deliberation and prudence of conservatism with the radicalism of undaunted progress. While the merits of the old creeds are fully appreciated, their errors are not overlooked. The ultimate consequences of the most radical thought are accepted, but care is taken to avoid the faults of a one-sided view.

THE QUINTESSENCE OF RELIGION

is shown to be a truth. It is a scientific truth (a reality) which has been and will remain the basis of ethics. The Quintessence of Religion contains all that is good and true, elevating and comforting in the old religions. Superstitious notions are recognized as mere accidental features of which Religion can be purified without harm to the properly religious spirit.

This idea is,

FEARLESSLY AND WITHOUT RESERVATION OF ANY KIND,

presented in its various scientific aspects and in its deep significance to intellectual and emotional life. If fully grasped, it will be found to satisfy the yearnings of the heart as well as the requirements of the intellect.

Facts which seem to bear unfavorably on this solution of the religious problem are not shunned, but openly faced. Criticisms have been welcome, and will always receive due attention. The severest criticism, we trust, will serve only to elucidate the truth of the main idea propounded in THE OPEN COURT.

RATES OF ADVERTISING.

For Each Insertion, without choice of position, per line	$ .10
" " " " " " per column	12.00
" " " " " " per page	20.00

Agate measure, 14 lines to the inch, 126 lines to the column.

For specified position, 20 per cent. will be added to regular rates.

THE OPEN COURT sent free to advertisers while their advertisements continue.

TO ADVERTISERS.—THE OPEN COURT will be found to offer especial advantages for the advertisement of Current Literature and the insertion of Publishers' notices. Its numbers being on file in all the prominent hotels, libraries and public institutions in the United States and Canada, and reaching the professional and scientific circles of every State in the Union. Only bona fide advertisements will be accepted.

Throughout the Postal Union:

TERMS, $2.00 PER YEAR. $1.00 FOR SIX MONTHS. $0.50 FOR THREE MONTHS. SINGLE COPIES, 10 CTS.

All communications should be addressed to

THE OPEN COURT,

(Nixon Building, 175 La Salle Street,)

P. O. DRAWER F. CHICAGO, ILL.

FORMER CONTRIBUTIONS TO "THE OPEN COURT."

GEN. M. M. TRUMBULL.

In No. 25 Gen. Trumbull has an article on "The Value of Doubt in the Study of History." He shows the tendency of historic writing toward exaggeration and falsehood; and he advises teachers to strengthen the minds of pupils by the exercise of doubt. Much of the history of the late war as written by our famous generals is as fabulous as the legend of Romulus and Remus. It is written by men interested in their own story, and therefore it comes under the suspicion cast upon it by the ordinary rules of evidence. "This war history," says Gen. Trumbull, "is woven out of camp-fire yarns." "Like the feet of Chinese children," he says, "our minds were crippled in infancy, and many of them have been lame ever since. They are not as useful to us as they would have been if strengthened in infancy by the exercise of doubt."

FR. HELBIG.

In Nos. 22, 23 and 24 is a deeply philosophical essay, "The Fool in the Drama," by Franz Helbig, another German scholar whose works refer to the History of Civilization. In this essay are shown in a delightful way the wisdom and the folly of the fool in the drama, and his value, not only to the body politic, but to the morals of human life. In the folly of the fool in the drama we see our own folly; and the satire of the fool administered in jest leaves a lesson behind it that makes us think seriously when the laughter is done.

GEORG VON GIZYCKI.

In Nos. 25 and 26 is presented a very scientific article entitled "Determinism versus Indeterminism," by Georg Von Gizycki, Professor of Philosophy at the University of Berlin. This is in answer to Professor William James of Harvard University, who, in a lecture published in the *Unitarian Review*, had maintained the doctrine of *indeterminism*. The whole inquiry relates to the Freedom of the Will, and the terms are thus explained:

"The question whether the actions of the will are phenomena which act in conformity to a law, admits of only two answers—*yes* and *no*.

The philosophic theory which holds that they do, has been called *Determinism;* that which says they do not is known as *Indeterminism*."

The argument, which is deeply philosophical throughout, and in some parts of it a demonstration, proceeds upon the theory that the human will is under the control of law, and that its actions are *determined* by necessity; that Freedom of the Will is never an accident, nor the offspring of caprice; that the reformation of an evil-doer is made by surrounding him with conditions whose laws will compel his will to act in the right way.

GEORGE M. GOULD.

In Nos. 24, 25 and 26 Mr. George M. Gould treats of "The Ethics of Economics" rather as a quality absent from our economic system than as a living principle belonging to it. His doctrine is that all things produced by human labor represent the expenditure of human life, and that dollars and dimes, being representatives of wealth or earnings, are as drops of precious human blood. Therefore, in order to a rightful ownership of dollars, we must earn them; we must return to society a share of our own lives equal to the quantity we have received from our fellow men. According to Mr. Gould, whenever we eat or drink we partake of a solemn eucharist, where "the shadowy ghost of humanity calls out to us: 'Take, eat; this is my body. Drink ye all of this, my blood which is shed for many.'" This is not to be understood metaphorically, he says, but as "an exact statement of the fact."

While perhaps the theory of economics presented by Mr. Gould may not be scientifically true in all its parts, the moral he draws from the actual facts of our industrial system is true enough for warning and for guidance. The partnership of capital and labor is the panacea of Mr. Gould, the solution of the labor question. But from his ideal plans of industrial emancipation he excludes unpleasant facts. He allows only *profit*-sharing to come in, and *loss*-sharing is never taken into calculation. Yet it is the possibility of loss that has thus far defeated the "co-operation" experiment. It is doubtful if the operatives in any great factory would accept the whole plant as a gift, if compelled to take it on the terms by which its owners run it, the chances of profit and *loss*.

There is some extravagance in his language, but that is only a measure of his benevolent impatience at the inequalities and wrongs which refuse to be cured by his remedies. That the "ethics of economics" lies in the doctrine of "equivalence for service" is very likely true, but there is a difference of opinion as to the correct measure of that "equivalence," and a still greater dispute as to the means by which that measure shall be legalized and enforced.

The Open Court.

A WEEKLY JOURNAL

Devoted to the Work of Conciliating Religion with Science.

No. 76. (Vol. II.—50.) CHICAGO, FEBRUARY 7, 1889. {Two Dollars per Year. Single Copies, 10 cts.

TRUTH AND FICTION.

BY DR. M. WILHELM MEYER, OF BERLIN.

Translated from the German by μκρκ.

Setting—a landscape in Spain. A balmy summer night. Beams of moon-light shimmering through the trees. "I had not long been walking back and forth, when I saw a sudden flash of light, that cast a golden radiance upon the trees and coppice far about. I glanced up, with a start, and beheld in the air a ball of fire, that seemed to hover in the distant space beyond the moon, and slowly to sink towards the spot where I was standing.... The fire-ball, which constantly increased in size as it approached, burst close above me with a loud report, and in its stead I saw a wondrously beautiful woman upon a chariot of blazing carbuncles, drawn by two fire-colored, winged dragons. Round about her, upon a light silver-tinged cloud, fluttered a host of Salamanders, in the shape of winged Cupids, of supernatural beauty. Her wavy tresses were like ringlets of sun-beams, her wings like flames of fire, her body whiter than driven snow in sun-light, and the roseate colors of morn played fantastically upon her cheeks and forehead."

The above remarkable observation was made by that intrepid hero, the youthful Don Sylvio of Rosalva, for whose veracity I have the competent authority of our patriarchal poet, Wieland. For my part, and in all honesty, I doubt not a moment that our youthful cavalier of fairy-land distinctly saw with his eyes the phenomenon above described.

But let me be permitted to add what I take the meaning of "eyes" in this case, to be. These flashing, presumptuous things, that from both sides of the nose seem to project out into the wide universe, and making the journey from star to star in a second of time, fancy they are able to pass from one eternity to another—these eyes into whose shadowy depths one often looks as into an abyss, unfathomable, unlimited, leading to bounds beyond the created world and to the soul of man no longer part of earthly things—these eyes, I say, so far as we can grasp them, are withal no more than windows in a house wherein some man may possibly live and whence he may look forth into the universe. If nobody stood behind the windows, they of themselves would certainly see nothing of the world. The man behind our windows of eyes is the mind. The impressions that are formed upon the retina, through the medium of the crystalline lens, are telegraphed by the optic nerves to the mind, as perfectly as circumstances allow, and the latter, if so disposed, forms from the dispatches he has separately received, an intelligible and connected whole. As a rule, and unless taken up with some particular whim, the mind from the very nature of its office is constantly bent upon arranging everything telegraphed to it into intelligible interdependence, and never stops until it finds that everything is properly in its place. If something is telegraphed, perchance, that at first sight appears absurd and of which the mind has never in its life heard before and consequently cannot unravel, it endeavors in such cases to attain peace of soul by autocratically asserting its authority as a court of last appeal and maintaining simply that the despatches have been tampered with; whereupon it commissions that imperious, flattering, cosmopolitan damsel, Imagination, to rectify the reports at her pleasure. Thus does the mind willfully hoodwink itself, for the purpose merely of upholding, at any price and with an eye to pious comfort, a conception of the world which it has previously formed, and which it has fashioned and elaborated with loving care. And so it comes that the poor corporeal eyes have nothing whatever to say, and more than that, that we do not know at all exactly what they really do see, or how the world really is made.

Among the different organs of sense no night-watch has, as a rule, been introduced. When the time to sleep comes, the telegraphists stationed at ears, eyes, and remaining senses, naturally grow weary. The shutters are closed and we go to sleep. Even the court of last resort, that thing so hard to define, which, having to give it a name, we have called the mind, condescends on such occasions to share this rest. But, sometimes, in the middle of the night, it occurs to it to get up again—not, however, to assert itself as a stern executive clothed with authority, but to seek amusement as a private citizen in a world of its own making, unobserved by its slumbering subordinates in office:—we dream. We see, hear, and feel, in such circumstances, exactly the same as if the administrative machinery of the human body politic were in complete and conso-

nant movement. Here, the inward man acts entirely upon his own score.

Sometimes, though, matters go further. The ambitious personage at the head of affairs, who just in the night-time feels himself especially at liberty and so hits upon all sorts of strange ideas, often takes it into his head to rouse a number of his deputies and press them into service to carry out his knavish projects. The engine-drivers that work the arms and legs at sovereign bidding, have to resume their duties. They are accustomed, since time out of mind, to carry out with slavish conscientiousness the work imposed upon them; and now they put the human machine into motion after the old fashion. We walk in our sleep, in pathways that we build in fancy; and while tripping about in the moon-light upon the roofs of houses, we fancy perchance we are hastening to a longed for rendezvous in a garden of oriental beauty. So long as the timorous and troublesomely pedantic inspectors stationed behind the ears and eyes, otherwise ready to telegraph every danger that threatens, are fast asleep, so long can we act as we please. Beware, however, of waking the man who is walking in his sleep. If you shout at him, the timorous inspector first starts up. This gentleman is at once seized with consternation at the noise, tears open the shutters, the telegraphists rush to their instruments and at once a hundred dispatches fly over the lines, announcing the dangerous situation at the seat of sovereign authority. As a consequence of the universal dismay, the mind is also struck with terror. "Mercy on us! What shall we do?" It telegraphs in every direction; and from every direction comes the answer: "Tumble from the roof, as people always do when they are in your fix." And he tumbles.

The case may occur too, that at times when the other functionaries are sleeping, the telegraphists behind eyes and ears may be half-awake, and though in an uncertain and stupefied condition, yet mechanically perform their duties. In which case incomplete dispatches arrive at headquarters and the man at the head of affairs fills them out as he pleases; and endeavoring, of course, to adjust matters as speedily as possible, gladly and involuntarily, as it were, accepts any suggestions that another person, completely awake, bids his senses telegraph him in explanation of what he has perceived. This condition of affairs is called hypnotic sleep. Here, the connection between the sensory instruments and the mind is only partly broken, and the electric battery is, so to say, poorly filled. We give the hypnotized subject a lemon. The image of the lemon will be formed of course upon the retina of the open eye. But the senses do nothing more than send an unintelligible telegram to the mind that the person has an article in his hand of indefinite color and indefinite character. The situation disturbs the unsleeping mind, which never likes to be aware of the presence of a thing without knowing its qualities, which might indeed be dangerous to life. Hereupon a bystander says to our subject: "That is a beautiful, sweet apple you have there, my friend; why do you not eat it?" This announcement is immediately and gladfully accepted by the perturbed mind. Of course! Plainly, that is an apple! And our subject takes a bite of it. The gustatory nerves receive a tremendous shock. But here too the connection with the mind is imperfect. The dispatch contains merely information as to a sensation—whether it is sweet or sour, it does not say. But the mind at once completes the dispatch in accordance with the idea previously transmitted to it. To it the object is a sweet apple, and the sour lemon is devoured with an expression of the most appreciative enjoyment.

If, now, the person were suddenly aroused from the hypnotic sleep, he would at once have the sour taste in his mouth, and would spit out, in disgust, what was left of the lemon. For now the dispatch from the gustatory nerves arrives in the mind in an unmutilated condition, and the latter is enabled to form its own judgment, which says that the lemon is sour.

This explanation of the hypnotic state appears to me the simplest, and that which most fully harmonizes with the experiences which a person in the normal state has with his own mind. It is a question of existence with him to find the quickest possible explanation for things about him. To this end he employs the testimony of his external senses. The connection between the mind and the senses, however, works poorly during hypnotic sleep. This induces a feeling of insecurity, and the hypnotized subject clings unconditionally to the explanations which another person in whom he has confidence makes by word or gesture. Thence also the power of the hypnotizer, which is only effective with believing subjects, who from the start recognize that the operator is intellectually their superior.

I believe, too, that there actually are people who see spirits with their open eyes and when really awake; presupposing, of course, that the persons in question are previously versed in spirit-lore or are at least inclined to believe that under certain circumstances supernatural beings can come down to us—whether directly from heaven or from the fourth dimension of space, it is immaterial.

It is in the night. From the moon-beams shining through the blinds the room is filled with a dim light wherein the eye, I mean the bodily eye, can see nothing with distinctness. In this case, therefore, it is the fault of the outer organ that the dispatches arrive at headquarters in an incomplete form and, frequently, unfit for purposes of explanation. A condition of mind,

consequently, quite similar to that of persons hypnotized, can easily occur in the present instance. Here the sense of disquiet and insecurity noticeable, is caused by the defective perceptive capacity of the outer organs in the flickering twilight, and in the state of hypnotism it is caused by the defective transmission of distinctly received impressions resulting from the poor conductive capacity of the telegraphic connections between the senses and the mind. In both cases imagination has to lend its assistance, to satisfy, by a trick of self-deception, the crying demand for causal interdependence.

A light draft of air is passing through the spacious halls of a mansion-house, wherein one is walking about alone, listening to the re-echoing foot steps, feeling here and there, and glancing about in timorous uncertainty. The wind touches us as with a thousand fingers of swiftly passing, bodiless beings. Suddenly something stirs behind the door of the next room. The person had not been looking directly at the spot, but he had noticed that a shining white body had slowly and noiselessly passed back of the doorway. Terrified, he quickly turns towards it. If he had been looking in that direction a moment before, he would have seen that it was a white curtain which had been lifted away from the window for a moment by the wind, and that a streak of moon-light had flitted lightly through. The curtain has fallen again now. But in the short space of time that the timorous observer takes to direct his eyes squarely upon the spot, a great mass of inferences has been arrived at. "That is a ghost. I saw it almost directly. I shall get a full view of it in a moment now." The imagination at once comes into active play, and while the corporeal eye really sees nothing, the imaginative faculty rapidly creates the image to harmonize with the generally accepted idea of how such things ought to be. The spiritual eye steps into the place of the bodily eye, which refuses all participation in the affair, and the subject sees perfectly well with the former everything that the circumstances of the situation demand of it.

The confounding of the spiritual with the corporeal eye can be so completely effected withal, that a person deceived in this manner will take in perfect faith the most sacred oaths upon having seen with his own eyes everything that his imagination has thus conjured up before him. This is why I believe everybody, upon word, when they tell me they have seen a ghost.

And so—to credit the reliable account of Wieland—did it happen to the youthful Don Sylvio, in whose ideas of the universe there existed fairies and salamanders just as surely as there do kings and presidents in our own. He was disturbed with the thought of how he was to find his beloved princess, who had been transfigured into a butterfly, and this thought engaged his whole attention. Suddenly, there appeared before his eyes a brilliant fire-ball as big as the moon, which flooded the landscape far about him with light of spectral transplendency. The marvelous phenomenon speeds earthward in rapid flight, and right above the head of the youthful cavalier, who half from delight and half from fear stands spell-bound by, the fire-ball bursts with fearful detonation; the glowing fragments fly like burning carbuncles through the air, and silver cloudlets tinged by the light of the moon take their place.

Thus far the description may correspond perfectly to reality. But now comes the element of fiction, whereby the strange phenomenon, so mysteriously appearing, sought and found an appropriate place in the young observer's ideas of cosmic order. That radiant object, soaring towards him from transmundane parts, could be nothing if not the intervention of a higher power in his fortune and course of life. The fire-ball vanished as quickly as it had appeared; the eye of the body ceased to furnish further material. But the imagination, too powerfully aroused by the gorgeous and unfamiliar spectacle, causes the inward eye to continue seeing what is further pleasant and acceptable to it. The change of *rôle* is effected so quickly, that the observer takes no note of it. The fairy is thus a natural metamorphosis of the fire-ball, and the rest follows of itself.

My readers may interpose the objection, perhaps, that I have occupied myself unnecessarily at length with the interpretation of a poetical fancy of Wieland. On the contrary.

I believe, indeed, that every creation of fancy receives its primal impulse from a materially real event; that the faculty of imagination is to be compared to a keg of powder, which lies inert and ineffective until a spark of real fire falls into it. The liberating force may be ever so feeble in comparison with the tremendous effect so suddenly produced; and yet without that impulse this effect could never have resulted.

The fanciful vision of the fire-ball and the fairy form emerging from it, we must assume to have arisen from some actual occurrence; and the material truth of the picture represented up to the point where the transcendental lady appears, the phenomena accompanying it, the serpentine flames curling about the bursting meteorite, the glowing body set with carbuncles that falls from it, the white clouds that encompass it, unequivocally pronounce that the poet had witnessed a magnificent phenomenon of this kind himself, and that a similar train of thought to that above sketched had led him to the development of the psychological processes imputed to his hero:—a scene painted with such exquisite marks of observative talent as to appear to us almost natural.

But I propose to go still further, and shall undertake to show that when brought face to face with extraordinary phenomena, suddenly appearing, we all of us belong to the category of fairy-knights and ghost-seers; and that we see events, for the time unexplainable, just as the spiritual eye pleases to see them.

On the fifth of December, 1880, at twenty-nine minutes after seven in the evening, a fire-ball swept across the city of Geneva, illuminating the entire adjacent district, for about two seconds, with a gorgeous bluish light. I chanced to be in a narrow street at the time and was only able to see the bright glare. Our machinist at the observatory was more fortunate. I reposed full confidence in his reports, for I had reason to assume that he suffered more from paroxysms in the legs than from illusions in the head. He told me that the fire ball appeared about three times smaller than the moon and had fallen perpendicularly towards the western horizon, where, before reaching the same, it vanished, without bursting apart and without making any noise.

If similar reports had been attainable from observers who had followed the course of the phenomenon at a distance of some miles from the city, I would have been in a position to fix the true path of the fire-ball, independent of our terrestial position, and to ascertain in what direction from the wide regions of universal space it had descended, and at what height it had passed over us. I accordingly published in the *Journal de Genève* a request to that effect, and received in answer scores of letters. Among them were three, whose writers thought it incumbent upon them to preface their account with the highest moral assurances of their credibility, and who all saw the meteor fall to the ground at a short distance from where they were standing, but every one of them at a place which lay miles away from the stations of the other two observers.

The first observer had seen the meteor burst just above the trees skirting the banks of the lake, in a suburb of Geneva. The fragments had shot through the branches of the trees and fallen upon the pavement below, where they broke in pieces, with a clatter and amid a shower of sparks. The people had run towards the spot, but could discover nothing. My reporter was looking from a window of his dwelling-house, some twenty yards away from the scene, and had observed the occurrence without possibility of deception. I subsequently examined the place described, saw nothing, however, to raise suspicion, and could find no black marks whatsoever upon the pavement. The second observer had seen the meteor, at the end of its course, fall between the spot where he was standing and the chateau of the Chevalier de Beaumont, in Collonge—a village situated at the foot of the Salève, about a league from Geneva. The meteor must certainly have fallen in the garden there. Here too all investigation was fruitless. My third informant, finally, contended with the pertinacity of a Galileo, in opposition to all other reports, that the fire-ball had plunged into the lake, by Chillon. The famous castle laved by the waters of Leman, that formed the brilliant theme of Byron's immortal poem, had loomed forth from the darkness, at that moment, in phantomlike grandeur and truly spectral resplendence. The distant snow covered peaks of Savoy, and the dancing waters beneath, seemed flooded in the blue light with an indescribable and magical radiance. Then the meteor had plunged straight downward before the shimmering, light-flooded mountains; the latter were plainly visible behind the flaming ball, and a moment later it had vanished in the hissing waters. And then all was darkness again.

It was easily proven, in contradiction of the descriptions sketched above, that all three witnesses of the phenomenon were mistaken. For as no detonation was reported—although the meteor was visible from its brilliant glare within a range of at least twenty miles—it never could have fallen to the earth: a noiseless fall of a meteor of equal brilliancy never occurred, and besides, from physical reasons, it is impossible.

Although I was unable, from the extremely contradictory reports given, to fix a definite path as the course of the meteor, yet it is undoubted that the fire-ball swept over Geneva at a distance of several leagues, and probably never came nearer to the earth. The dazzling light into which the fire-ball suddenly blazed, and its course which led almost perpendicularly to the horizon, had at once convinced all who witnessed the phenomenon that the meteor was in their immediate vicinity and was descending towards them. All the faculties of the mind, and particularly the ever ready and helpful faculty of imagination, had been brought into active and rapid play by the extraordinary sight, and upon the sudden and unexpected disappearance of the brilliant object could not be brought immediately to a state of rest. That which they expected to see a moment later, they in fact did see quite distinctly—of course, with the inner eye only, the corporeal eye suddenly ceasing to furnish further accounts. Only after the occurrence had come, in consonance with our ideas, to a proper termination—in other words, when the meteor had fallen to the pavement, in the garden, or in the lake—did the spiritual eye discontinue to make its observations. The deception was so complete that one observer had distinctly heard the rattling of the fragments upon the side-walk, and another the hissing of the water when the meteor struck the lake. Imagination had in each case occasioned the entire deception.

From this and various other circumstances the apparent result inferable is, that the functions of the mind are subject to a kind of law of inertia, by virtue of which the mind is to be brought only with difficulty into a definite direction; yet when once forced into activity by a powerful impulse, it is unable immediately to stop upon the cessation of the originating impulse, but continues, for a while, undisturbed in its progress, until finally the friction from the evident inconsistency of appearances become too great.

JIM THE INVENTOR.

BY WHEELBARROW.

My friend Jim Short is a mechanic; and what is more, he is a genius in mechanics. Had he been simply a mechanic he might have prospered and made money, but being a genius he has accumulated nothing but glory, on which he will receive no dividends in this world. They will all go to the multitudinous corporation known as Homo Brothers and Co. It is a surprise to Jim that this practical epoch does not use genius well. It has neither time nor money to waste on theoretical men. After a long and weary search, Jim Short has discovered the principle of perpetual motion, and he has invented a machine to utilize it for the abolition of hard work. It needs only a few more wheels and pulleys to make it perfect, and then the social problem will be solved; we shall need no exercise, but play. It unites the virtues of the philosopher's stone, the elixir of life, and the Balm of Gilead. It is the supreme panacea which, like Aaron's rod, shall swallow all the rest.

They give no credit at the patent office, and they refuse to issue patents on ideal inventions. They will not accept promissory plans, models, and specifications latent in the inventor's brain. They insist on realities made of wood, and leather, and iron. This is the prosy reason why Jim has not received a patent for his promise of "perpetual motion." His models contain cogs, wheels, concentrics, eccentrics, and pulleys enough for twenty patents, but because they lack just two trifling elements, a lever and a fulcrum, the department absurdly refuses a patent, and what is worse, the government declines to furnish genius with money enough to supply the missing powers. The people refuse faith, and the government refuses money. That Jim's manifold patterns do not work is no fault of his, but of the heedless government which declines to render him substantial aid. His efforts being for the benefit of all the people, Jim thinks that the government should subsidize his genius or at least encourage it with a pension, that he may pursue his experiments above the cankering fear of poverty. Morse received a subsidy for a promise of quick motion, and why should not Jim receive a like stimulus for his promise of perpetual motion? He wants a few immediate assets and there are none in the assurance that he shall be renowned in after ages like Watt and Stephenson.

Jim's definition of his perpetual motion machine is this: he describes it as a mechanical contrivance that needs no food and works for ever. It is the one great miracle under the sun. The skeptical crowd laugh kindly at poor Jim as a visionary in mechanical economy. They easily detect the flaw in his logic, but with childish credulity they pin their own faith to inventors in political economy more visionary than Jim. His theory is a panacea that works in all emergencies and cures everything; so is theirs. Each of them declares that he has discovered the secret of perpetual motion, and as soon as he can supply a lever and a fulcrum to his machine he will abolish every form of social disease. Jim is not alone in fairy-land. The woods there are full of dreamers fantastical as he.

Forty-five years ago, there was a social reformer in England, who found "perpetual motion" in the spade. His theory was to abolish the plow and divide England up into four-acre farms, to be cultivated by the spade alone. This would give employment to everybody, and poverty would cease to be. He was correct, because it is very plain that to cultivate all England with the spade would require the muscle of all her people. He put more than a million dollars into his experiment. He bought large tracts of land, divided it up into four-acre farms, armed his "freeholders" with spades, and set them to work. The scheme failed, and the failure broke his heart. In his efforts to find the missing lever, fulcrum, or whatever it was that his machine wanted, he became insane, and died at last in the lunatic asylum.

A very popular "perpetual motion" machine is the panacea known as the single tax on land-values, which is to abolish poverty. In fact the proprietary name of it stamped upon the bottles, is "Anti-Poverty." All other preparations for abolishing poverty are counterfeit. Another inventor, of the type and quality of Jim, assures me that he has discovered "perpetual motion" in State Socialism, where all of us are to be absorbed into that ethereal Nirvana which is called "government," wherein we are to live and move and have our being. Another tells me that he has found "perpetual motion" in the principle of individualism, or anarchy, where government is unknown because unnecessary; where every man is his own policeman, clubbing himself over the head whenever he does wrong and continuously taking himself into custody. Another assures me that he has found the great principle in mutual banking and an unlimited supply of paper ten-dollar pieces. When every man has a pocket full of bank stock, Utopia becomes a geographical fact. When

we can draw on the bank for whatever amount we need by simply depositing a philosopher's stone in the safe, "perpetual motion" becomes a crystallized reality. I have a friend, an editor of a newspaper, who writes me that he has found "perpetual motion" in a graduated income tax by which every man is to be fined in proportion to his prosperity, the fines to go to the unprosperous. He does not know that this was one of the resources of the French Republic, a hundred years ago, by which "equality" was to be established among all the people.

Jim, the inventor, is not alone in his theories of "perpetual motion." He has the company of hundreds, who believe that they have solved the riddle of ages, and that their special inventions, if they can only get them patented, will bring the millennium in.

AXIOMS THE BASIS OF MATHEMATICS.

BY DR. EDWARD BROOKS, OF PHILADELPHIA.

In an interesting discussion by the editor of THE OPEN COURT it is stated that "mathematics is unfortunately constructed on axioms," which gives to it "an air of mysteriousness," and led Schopenhauer to declare that "the whole science, being based upon non-proven truths, remains non-proven." Of course any one who is familiar with the spirit of modern philosophical thought, will readily understand the reasoning that leads to this conclusion; but it is a position so different from the usually accepted one that it always invites discussion. My own conception of the subject points to a different conclusion, and I throw together a few paragraphs in the line of this thought.

I begin by saying that there are some things of which we may say, *they exist, they are.* The universe is; both monism and dualism assume the existence of a something, or an aggregation of things, which we call the Universe. So also it is assumed that thought is, that a something (brain or mind) which thinks is, that the laws and principles of science are. All thought is based on the assumption that some things exist, that there is a certainty of their existence, and also that there is a certainty that we know they exist.

Moreover, there are existences which are not material, as space, time, feeling, thought, etc. The paper upon which THE OPEN COURT is printed exists, it has length, breadth and thickness; length, breadth and thickness are possible only in space, therefore space also exists. Mr. Gladstone is eighty years of age, the time he has lived is an actuality and cannot be destroyed. This time is possible only in the great fact of Time of which the eighty years are a part; hence there is an existence which we call Time. The paper of THE OPEN COURT not only exists, but the ideas and truths which it contains, also have an existence; hence thought and the great truths which it discovers or evolves, are actual existences in the universe.

And again, some things not only exist, but their existence is a necessity. Nothing can overthrow or destroy their existence. They exist independently of all conditions, and are subject to no contingencies. They are an essential part of the universe, without which there could be no known or conceivable universe. Space exists as an essential condition for the existence of matter, but space would continue to exist even were all matter destroyed. I am aware that the truth of the statements of this paragraph will be questioned, but though they are not necessary to my argument, I let them stand as indicating the line of my thought.

Now some of the above statements are true, or else the statements of their opposites are true; hence there is such a thing as Truth. Some truths may be derived from other truths: thus, if it be true that "all men are mortal," then it is also true that "some men are mortal." Such a derivation of one truth from one or more other truths is called reasoning. Reasoning is based on laws of inference, which are also truths. All reasoning can be traced back to truths which cannot be derived from other truths, and hence are not the result of reasoning. Such truths, underived from other truths, are called *axioms.* These axioms used in geometry relate not only to quantity but also to logic, for every syllogism proceeds by a self-evident truth of inference. Now because these axioms are not proved truths, Schopenhauer and others claim that the truths derived from them are themselves unproved.

Let us see how much force there is in this assertion. We begin with our first proposition that something is. This applies not only to material things, but also to laws, principles, truths, etc. The truth of a theorem is a something that has existence as much so as a tree or a mountain. It is an existence, too, that is stable and unchangeable. The tree may disappear, the mountain may be leveled or sunk in the ocean, but the truth of a mathematical theorem will never change. The truth that "two straight lines cannot inclose a space," or that "a straight line is the shortest distance from one point to another," will always remain true.

These truths of mathematics are especially noted for their certainty. Of the cognitions in the domain of sense we may be mistaken; we may think we see a cow in the meadow, when there is only a speck on the window pane. But there is no uncertainty attending the truths of arithmetic and geometry. We may infer by induction that heat will expand all metals; but we are never sure that a metal may not be discovered which would prove an exception to the law. In the case of mathematical truths, however, we are certain that there can be no exception. We are absolutely certain, for instance, that no case can ever be found in

which the cone is not equal to one-third of the cylinder with the same base and altitude. If we should make vessels of these forms and, testing it with water, not find it verified, we would doubt the correctness of our experiment, but never the result of our reasoning in the demonstration of the truth stated. These truths of mathematics are thus especially distinguished for their certainty and the impossibility of any exceptions.

Again, some truths are not only true, but they are necessarily true. This is especially the case with mathematical truths. Thus, "the sum of 2 and 3 is 5," is not only true, but is necessarily true. No power or circumstances can make it otherwise. So also the proposition that "the sum of the angles of a quadrilateral equals four right angles," or "the sum of the angels of a pentagon equals six right angles;"—they are not only true, but their truth is a necessity. No change of form or size will affect these principles of plane polygons; they have always been true, and will always be true. So also "the square on the hypotenuse equals the sum of the squares on the other two sides" is a truth which is not only certainly true, but is also necessarily true. No right-angled triangle can be made in which the sum of the squares in the two sides will differ by the smallest quantity from the square on the hypotenuse.

Now, we not only have truths which are necessarily true, but the mind has the power of knowing that they are necessarily true. I know that I am writing this article; and I know that the statement just written is true. We can know positively also that a truth derived from another truth, by the laws of reasoning, is true. Thus the mind has the power of knowing a truth to be true, and also of knowing it to be necessarily true. We not only know that "2 and 3 are 5" is true; but also that the sum cannot be 4 or 6 or anything but 5. We know that no power can cause the square on the hypotenuse to differ one iota from the sum of the squares on the base and perpendicular. We therefore know the necessity of truths derived by the laws of reasoning from axiomatic premises. In all this there is no mystery, but a clear conception of both common sense and philosophy.

But now what of these first truths from which or by means of which we derive these other truths? Well, first, we assert that they are true, and that we can know they are true. Second, we assert that they are necessarily true. The proposition "things that are equal to the same thing are equal to one another" is absolutely and necessarily true. It is impossible for the statement to be untrue. Third, and here is where the difficulty seems to arise, we *have the power to know* that they are true, and also to know that they are necessarily true. No one will question the mind's ability to see that a derived truth is true (assuming that the premises are true); it is universally admitted that the mind has this power. But, it is equally certain that the mind has the power to see the truth of what are called *first truths* or *axioms*. To deny them is to take a position which we know is incorrect; to assert their opposite is to make an assertion which we know to be false. It needs no argument to prove that the denial of an axiom is false; we just know that it is false and that is the end of it. Our knowing, in these cases, is a finality; and we know that our knowing is correct. In other words, the mind has the power of cognizing axiomatic truths, and of knowing that they are both true and necessarily true.

For instance, I know that "to-day is not yesterday," that "a tree is not a man," that "Mr. Gladstone is not Mr. Blaine," etc.; these and similar propositions I know to be absolutely true, and every one else who understands them knows the same. So also with such axioms as "the whole is greater than any of its parts," "a straight line is the shortest distance between two points," etc.; every one knows them to be true as soon as they are announced or conceived. Such truths which are necessarily true and which we know to be necessarily true, constitute the basis from which the other truths of geometry are derived. These basal truths need no proof; they are self-evident and carry their certainty and necessity in their own nature. As such they afford a firm basis upon which the other truths may securely rest. They are unproved merely because they need no proof. If they could be proved, it would not add to their certainty. A thousand proofs, if such were possible, would not strengthen our faith in them or make them any more certain. It is thus a misleading statement to say that the proved truths of geometry are "unproven," and therefore may possess a flavor of uncertainty because they are derived from unproven truths. On the contrary, the utmost certainty attaches to the truths of geometry because they are derived by laws of inference absolutely true, from previous truths absolutely true. There is no mystery actual or philosophical in respect to the matter; and it is difficult to see how the basing of mathematics on axioms is in any sense an unfortunate one.

But the question may be pushed, How do we know that these axioms are true? I reply, there is no "how," we know them to be true; we just know they are true and that is the end of it. To know how we know them to be true, would be equivalent to proving them to be true, and they are beyond and independent of proof. To prove a truth is to establish it by some other truth; but there are no truths back of or before these axiomatic truths which authenticate them. They are absolutely first truths, underived and self-existent, and as such are cognized by the mind. Suppose I ask you, how do you know that you think; you say you are con-

scious of it, but that is merely saying you know you think. That is all there is in it; you just know that you think; there is no proof of it but your knowledge of it, and you ask for no proof. No one can prove you do not think; and no proof that you do would add any certainty to your knowledge that you do think. Your knowledge that you think is a first truth to you. First truths exist in the very nature of things, they are absolute and necessary; and the mind has the power to cognize them as they are and to cognize also their certainty and necessity. The process, though admirable and even grand, is simple and free from mystery.

And now is it possible to depart from this method of the use of axioms in the development of mathematical science? Grassmann has attempted such a departure; but it is far from certain that he has succeeded. Are not most of his postulates merely axioms in disguise? How does he know that "space has three dimensions;" is not this a cognition of Intuition, "a truth to be taken on faith?" He never saw a "dimension" or a "point," for a dimension is merely *length*, and length is a conception of reason and not an object of sense. No eye ever saw "a point;" it is seen only "in the mind's eye," that is by the eye of intuition. And then as soon as he begins to reason from these postulates he makes use of axiomatic truths; so that both in his premises and his inferences he makes use of truths which have not been proved, and thus each derived truth of his system is based upon an axiomatic truth either of quantity or logic. And so any attempt to construct a science of mathematics on anything but intuitive cognitions and self-evident truths will be actually found to involve those conceptions and truths. Shall we not be content to "let well enough alone," and rest with absolute certainty on the present system of geometry?

COGNITION, KNOWLEDGE, AND TRUTH.

Cognition in its simplest form is the act of feeling a percept to be the same as another percept perceived before. Cognition thus is founded in the relations of our percepts among each other. A single impression cannot as yet constitute cognition; two or several percepts of the same kind are needed in order to feel their identity.

Cognition consists of two elements; it has a subjective and an objective phase. The objective phase is that the object now perceived is the same (or at least in some respect the same) as the object perceived before; and the subjective phase is that it is also felt to be the same. The new percept fitting itself into the form produced in the brain by the former percept, is, in the literal sense of the word, re-cognized: it is cognized again. The condition of knowledge accordingly, in its simplest form, is 'the sameness of two or more percepts.'

Cognition of the higher and more complicated kind remains at bottom the same. It is always the act of recognizing a unity or a sameness in two or several phenomena. Cognition always presupposes a certain stock of experience, and to understand a phenomenon or to explain it means to recognize its identity with other phenomena with which we are familiar. The falling of stones to the ground is a familiar occurrence with us, and to show in how far the motion of the moon about the earth is the same kind of motion as that of the falling stone, only under other conditions, is an explanation of this phenomenon.

Knowledge is the formulated stock of experiences in which we have discovered common features, so that their identity even under different conditions has been and will always again be recognized.

Knowledge in animals is simple in comparison with knowledge in man. Animals easily recognize concrete things and persons, but they are not able to sum up their knowledge in abstract formulas; they cannot name things, they cannot speak, they cannot think in abstract ideas. Man's knowledge rises into the realm of abstract thought where he creates a new world of spiritual existence.

The data of the natural sciences are always certain phenomena of which we are aware by sensation. We classify these phenomena so as to embrace them by the same law in innumerable and, in many respects, apparently different processes. Take, for instance, the tiny luminous specks in the nocturnal sky which we as well as many animals perceive by our visual organs. To the animal the stars are meaningless,* to the savage they are mysterious beings of an undiscoverable origin; but the astronomer by the aid of computing, and measuring, and calculating, with the additional help of telescopes, arranges in his mind the phenomena of the starry heaven in such a way as to make of his luminous sensations a well-ordered whole, standing in unison with all the other facts of our experience.

Abstract ideas, generalizations, and conceptions of natural laws are the most important factors of human existence proper. By the help of abstract thought only has man become man. By the help of abstract thought only can he realize that he is a part of the whole of All-existence: he becomes religious. By the help of abstract thought he can regulate his actions according to maxims of universal applicability, so that he remains in harmony with the cosmical order of the Universe—with God: he becomes a moral being. By the help of abstract thought he can formulate his experiences in the rigid forms of arithmetical, geometrical, mechanical, or logical expressions, so that he comprehends the im-

* Incidentally may be mentioned, that to the higher animals natural phenomena gain in impressiveness. The monkeys of the Sunda Isles, we are informed, gather shortly before sunrise in the highest tree-tops and salute the first rays of the rising sun with clamorous shouts.

manent necessity of the order of nature: he becomes scientific. When he finds that his abstract conceptions, his ideas, are realized in certain regular or characteristic instances, he acquires artistic taste; and when he begins to express his ideas in a visible or audible form, in colors, in sounds, or in words so that his creations represent single instances, incarnations as it were, of his ideas, he becomes an artist,—a painter, a musician, or a poet. If man succeeds in unifying all his knowledge on a scientific basis, so that it is systematized as a unitary conception of world and life and the aim of life, he becomes a philosopher. Thus abstract thought is the basis of all higher, intellectual, human, and humane aspirations. It raises man high above all the rest of animal creation and makes him their master. It is the cornerstone of humanity and produces Religion, Ethics, Science, Art, and Philosophy.

Abstract thoughts do not on the one hand represent absolute existences, nor on the other are they mere air castles; they are built upon the solid ground of reality. The facts of nature are specie and our abstract thoughts are bills which serve to economize the process of an exchange of thought. We must know the exact value in specie of every bill which is in our possession. And if the values of our abstract ideas are not ultimately founded upon the reality of positive facts, they are like bills or drafts for the payment of which there is no money in the bank.

Reality is often identified with material existence, as if matter were an exhaustive term for all that is real. Matter is an abstract; matter of itself, absolute matter, does not exist. Matter cannot even be conceived as real unless it is possessed with some kind of force (or motion, or energy); forceless matter is a non-entity. Further, every single particle of matter must appear in some special form. Formless matter is a non-entity also. Matter, force, and form are abstracts only, which we have made for our own convenience of comprehending the phenomena of the world. Reality itself is one undivided and indivisible whole. The most important abstraction among the three (matter, force, and form), we do not hesitate to say is, neither matter nor force, but form.

Matter is a general conception abstracted from things material; it indicates their property of possessing mass and volume, but excludes all special or individual features of material bodies. At the same time, accordingly, it is an extremely poor and empty concept. Generalizations naturally are the more void, the higher they are. The same may be said of motion as well as of force. Motion means change of place; force signifies that which is productive of a change of place. In order to know matter, we must become familiar with all kinds of matter, and in order to know the forces of nature we must study the natural phenomena, *viz.*, the actual motions that are taking place.

The concept 'form' is not so barren as the generalizations 'matter' and 'force.' We cannot create new matter, neither can we create new force or motion, but we can create new forms. We can in our mind construct new combinations; and if they have been correctly arranged in our thoughts, they will (when an attempt at their execution is made) be seen to be realizable. The laws of form laid down in the formal sciences (in mathematics, arithmetic, pure logic, etc.), can be ascertained by self-observation. While we create new forms in our mind we evolve the more complex combinations from the simple ones and can thus comprehend them. We can, by methodical generalization, as well as consistent application of generalizations to different cases, exhaust the possibility of instances and thus formulate universal rules.

Form constitutes the order of the world, its cognizability and intelligibility. It imparts to the universe the spirituality of its existence. Form and the changeability of form make evolution possible. The evolution of forms brings sense and meaning into the forces of nature; it affords a direction to their movements and determines the progressive character of all growth. Form, a special kind of form, constitutes mind and human intelligence, and the establishment of the sciences of formal thought is the basis of exact philosophy. Form gives purpose to life and the problem of ethics finds in it its solution.

We now ask that often repeated question of Pilate, "What is truth?" Tradition says that Pilate was a skeptic; like the agnostic of modern days, he did not consider it worth his while to wait for a reply. And the gospel informs us that Jesus did not deign to answer him.

There have been complaints that we never can know 'absolute truth'; and indeed 'absolute truth' is unknowable because such a thing as 'absolute truth' does not exist. Cognition is a relation, and truth, if it has any meaning at all, means true cognition. Therefore the very essence of truth is a relation; and this relation is neither mysterious, nor inscrutable, nor unknowable, nor a profound secret; it can be ascertained perfectly well.

A conception, or a cognizance, or a formula of a number of experiences, or an abstract idea is true if it is in unison with all facts of reality; it is not true if in any way it conflicts with or is contradicted by facts of reality. The facts of reality remain the ultimate data of all our knowledge; truth is the unison of our conception of single facts with the whole system of all facts, and science as well as philosophy is our aspiration to realize the unity of nature.

BYRON.

BY LOUIS BELROSE, JR.

O Singer of the summit and the sea,
O lover of the tempest, who divined
The language of the lightning and the wind,
Byron! the very air is full of thee.

Thy song was of the mountains and the free
Far-rolling ocean, where thine ears could find
Relief from rattle of the chains that bind
The tortured spirit of humanity.

A forest is thy poem, where my soul
Roams on through tropic luxury to climb
The snow-clad glorious heights that top the whole.

But there be those that root amid the slime
For noxious weeds; and when they find, extol
The little kitchen-gardeners of rhyme.

In view of the VILLA DIODATI, near GENEVA, 1877.

CERVANTES.

BY LOUIS BELROSE, JR.

Thou wast a poet after my own heart,
Cervantes.—When all Europe's hopes and fears
Followed Don Juan, yet a boy in years
Lepanto saw thee play the hero's part.

And when thy fortune led thee to this mart
Of Islam's foes, although a slave, the tears
Of twenty thousand captives in Algiers
Fell fewer for thy courage and thine art.

Ennobled by the hand that held the sword
With all the soldier's virtues, frank and free,
Thy pen spoke plain to rabble, priest, and lord;

Nor was the recompense refused to thee;
For parasite and pander swelled the horde
That mocked thy wounds, thine age, and poverty.

ALGIERS.

SHELLEY.

BY WILLIAM BRUNTON.

O for the bird-wing breasting ether fine,
Surveying earth a tiny speck beneath,
The curling of great seas in serpent-sheath,
Inlaid with emerald lands from line to line!—

O for the virgin lips of dew-steeped flower,
Whose perfumed heart with love delights the day!—
Or for the fairy lute of lark, whose lay
Dispels despondency, as sunshine shower!

Yet why beseech such god-blest gifts of old,
When our Prometheus won their varied worth?—
His eagle flight was so, his mouth of gold,
His lyric melody of heaven's own birth:

His orbic nature each perfection stole;
He lived like lark with swest Narcissus soul!

THE LOST MANUSCRIPT.*

BY GUSTAV FREYTAG.

CHAPTER XXX.—Continued.

Ilse was again alone in the hall, looking sadly at the strange walls. All the sorrow that had ever moved a human soul in this room, jealousy and wounded pride, feverish expectation and hopeless longing, mourning over the destruction of happiness, and terror for the future, the cries of anguish and the plaints of tormented conscience, all these now awoke an indistinct and trembling echo in the heart of the woman.

"It is strange and gloomy here, and if I try to express in words what distresses me, all power of expression fails me. I am no prisoner, and yet the air that surrounds me is that of a dungeon. The Chamberlain has not been near me for days, and the young Prince, who used to speak to me as to a friend, comes seldom, and then but for a few minutes, and it is worse than if he were not here. He is as depressed as I am, and looks at me as if he felt the same nameless anguish. And his father? when he comes to me he is so kind that one cannot but like him; but as soon as he turns his back his features appear before my mind distorted. It is not good to be near the great people of the world; they seem to take a fancy to one and open their heart as to friends, and one scarcely feels the elevation of mind occasioned by this, when tormenting spirits seem suddenly to draw them back into their invisible realm, and one is troubled and excited about them. Such a life is destructive of peace.

"Felix says, one ought not to care about these frivolous people. How can one avoid interest and anxiety about them when the welfare of their souls is a blessing to all?

"Is it only this that gives you such restless thoughts, Ilse?" she asked herself; "is it this, or is it pride, now wounded, and now again flattered; or is it anguish about the loved one whom she wishes secretly to tear from you?

"Why am I so fearful about you, my Felix? Why do I despair because he has found a woman here of the same stamp of mind as his own? Am I not so also? Have I too not unfolded in the light of his mind? I am no longer the ignorant country-girl that he once brought from among the herds. If I am deficient in the attractive charm of the distinguished lady, what can she give him more than I? He is no boy, and he knows that every hour I live for him. I despise you, miserable thoughts; how have you found entrance into my soul? I am no prisoner within these walls, and if I linger here where you have power over me, I remain on his account. One should not forsake him whom one loves,—that word was spoken for me also. My father's child shall not cry and mourn even though her loved one should be sitting with the Princess by the hazel-bush."

* * *

Gabriel was stealing along in a distant part of the pleasure-ground. He suddenly felt a touch on his shoulder; Prince Victor was standing behind him.

"Friend Gabriel?"

"At your Highness's commands."

* Translation copyrighted.

"Where have you served?"

"With the Blue Hussars."

"Good," nodded the Prince; "we are in the same branch of the service. I hear you are a trustworthy fellow. But what is the matter with you?" He took out his purse. "We will share; take what you want."

Gabriel shook his head.

"Then the women are at fault," cried the Prince; "that is worse. Is she proud?"

Gabriel dissented.

"Is she faithless?"

The poor fellow turned away.

"I am, alas! a bad intercessor with parents," said the Prince, sympathizingly; "the race of fathers have little confidence in me. But if it is only a question of appealing to a girl's conscience, then depend upon me."

"I thank you for your good-will, Highness, but nothing can help me. I will have to fight it out alone."

He turned away again.

"Bah! comrade, have you forgotten the soldiers' saying: 'Like all, love one, grieve for none?' If your heart is heavy, you should not rove about as you do. In lack of another companion put up for the time with me."

"That is too much honor," said Gabriel, taking off his cap.

The Prince had during this conversation gradually led him into a thicket; he seated himself on the root of an old tree, and motioned Gabriel to the next trunk.

"We are in concealment here; you look out that way, I will watch this road, that no one can surprise us. How do your lodgings please you? Have you found pleasant acquaintances?"

"I think it prudent to trust no one here," answered Gabriel, cautiously.

"But I do not belong here; there is no reason why you should not make me an exception. You may assume that we belong to the same company, that we are sitting by the same fire, and drinking from the same flask. You are right: all is not so safe here as it looks. I do not like these nocturnal disturbances in the castle. Have you heard of them?"

Gabriel assented.

"In such an old castle," continued the Prince, "there are many doors that few know—perhaps also passages in the wall. Whether it is spirits or something else, who knows? It glides about and sometimes comes out when one least expects it; and just when one has put on one's night-shirt a secret door is opened, or a plank in the floor rises, and a cursed apparition floats up, removes what is on the table, and before one can bethink oneself, disappears again."

"Who can allow such a thing, your Highness?" replied Gabriel, valiantly.

"Who can be on his guard?" said the Prince, laughing; "it stretches out its hand, and one becomes immovable; it holds a sponge before the nose of the sleeper and he does not awake."

Gabriel listened attentively.

"People say that in the Pavilion all is not secure," continued the Prince. "It would be as well for a trusty man to make an examination in secret; and if an entrance should be found that is not regular it should be fastened with a screw or a bolt. It is indeed uncertain whether or not one may find such a thing, for such devil's work is slyly managed."

He nodded significantly to Gabriel, who stared at him in great astonishment.

"That is only a thought of mine," said the Prince; but when a soldier is in foreign quarters he looks after every security during the time that his people sleep."

"I understand all," replied Gabriel, in a low voice.

"One must not cause others unnecessary alarm," continued the Prince; "but in secret one may do one's duty like a brave man. I see you are that." The Prince rose from his seat. "If you should at any time need my help, or have anything to tell me which no one else should know, I have a fellow with a great moustache, a good, quiet man; make his acquaintance. For the rest, take care of yourselves here. There is a lackey who idles about near you; if there are any errands to do he can attend to them. It is a good thing for a family to have a trustworthy man at hand in a strange house. Good day, comrade, I hope I have changed the current of your thoughts."

He went away; Gabriel remained in deep thought. The bantering of the Prince had roused the honest man from his sorrow; he busied himself now about the house in the day-time, but in the evening, when his master and mistress were at the theatre, he was to be seen sometimes with the Prince's servant in confidential conversation on a garden bench.

The spirit of sad foreboding spread its grey veil over the walls of the Pavilion, but in the Sovereign's castle meanwhile an invisible hobgoblin of another kind was at work, disturbing great and small. The stable was in consternation. The Prince's favorite saddle-horse was a white Ivenacker. When in the morning the groom went to the horse, he found it with a large black heart painted on its chest. He could not wash out the scandalous mark, probably the evil spirit had in this prank employed a dye intended for the hair of man. Connoisseurs declared that only time could heal the injury. They could not help making it known to the Sovereign who was violently angry, and set the strictest investigations on foot. The night-watchers of the stable had seen no one, no stranger's foot had entered the place; only the groom of Prince Victor, a moustached foreigner, had, at the same time with the other stable servants, cleaned the horse that

he had lately received as a present from a relative. The man was examined, he spoke little German, was said by the other servants to be harmless and simple, and nothing could be learnt from him. Finally, the stable-boy who had kept watch was dismissed from service. He disappeared from the capital, and would have been reduced to great misery if Prince Victor had not provided for the poor wretch in his garrison.

There was a great uproar among the ballet-girls. In the new tragic ballet, "The Water Sprite," the first dancer, Guiseppa Scarletti, had a brilliant *rôle*, in which she was to wear green-silk trunks, with rich silver trimmings. When she was to put on this part of the costume, which was very important for the *rôle*, for the first representation, her assistant was so awkward as to hand it to her wrong side foremost. The lady expressed her displeasure strongly, the tire-woman turned it round, and it was still wrong. Upon nearer inspection of this piece of art, it was discovered, with dismay, that it presented two convex surfaces like the shell of a bivalve. Mademoiselle Scarletti broke out into a fury, and then into tears and finally hysterics; the manager and the intendant were called; the *artiste* declared that after this disgrace and disturbance she could not dance. It was not until Prince Victor, whom she highly esteemed, came into the dressing-room to express his deep indignation, and the Sovereign desired her to be told that the insult should be punished in the severest manner, that she recovered sufficient courage to play the difficult *rôle*. Meanwhile the fairy-like rapidity of the theatrical tailor had remedied the injury to her dress. She danced superbly, but with a sad expression that became her well. The intendant was already rejoicing that the misfortune had thus passed off, when suddenly, in the midst of the last scene, when the whole depth of the stage was disclosed, the exchanged trunks appeared under Bengal lights in the water nymph's grotto, hanging peacefully upon two projecting points of a silver rock, as if a water sprite had hung them up to dry. Upon this there was a disturbance, and loud laughter among the audience, and the curtain had to fall before the Bengal lights were extinguished. It all looked like revenge, but again the culprit could not be discovered.

The hair of all the servants stood on end. They knew that in the bad times of the princely house a black lady walked through the corridors and rooms, which portended misfortune to it. The belief in this was general; even the High Marshal shared in it; the black lady had appeared to his grandfather, when, on a lonely night, he was awaiting the return of his gracious master. One evening, after the Court had withdrawn, the Marshal was walking, with the lackey carrying a light before him, through the empty rooms to the wing in which Prince Victor lodged, in order to smoke a cigar with him. Suddenly the lackey started back and pointed, trembling, to a corner. There stood the black figure, the head covered with a veil; she raised her hand threateningly, and disappeared through a door in the tapestry. The light fell out of the hand of the lackey, the Marshal groped in the dark to the ante-room of the Prince, and sank down on the sofa there. When the Prince entered from his dressing-room he found him in a state of the highest consternation: even a glass of punch, which he himself poured out, could not arouse him from his depression. The news that the black lady had appeared flew throughout the castle; an uneasy foreboding of evil occupied the Court. In the evening the lackeys ran hurriedly through the corridor, and were frightened at the echo of their own steps, and the Court ladies would not leave their rooms without escort. The Sovereign also heard of it; his brow contracted gloomily, and at dinner he looked contemptuously at the Marshal.

Even the Court ladies were not spared. Miss von Lossau, who lodged in a wing of the palace over the rooms of the Princess, returned to her apartment one night in the happiest frame of mind. Prince Victor had paid her marked attentions. He had been very amusing, and had shown a degree of feeling which he had never before evinced. Her maid undressed her, and she laid herself to rest with sweet and pleasant thoughts. All was quiet: she fell into her first sleep. The image of the Prince danced before her; then she heard a slight noise; there was a crackling; something moved slowly under her bed. She started; the mysterious noise ceased. She was on the point of deluding herself into the belief that it was a dream, when the noise was repeated under the bed, and something came clattering out. She heard an alarming sound, and saw by the faint light of the night-lamp that a ball was slowly pushing itself behind the chair, and stopping in front of the bed. Half unconscious from terror, she jumped out of bed, touched a strange object with her naked foot, at once felt a sharp pain, and sank back with a scream. She now raised a loud cry for help, till her maid rushed in, and tremblingly lit the candle. The lady was still shrieking in a corner, where the prickly spectre-ball still lingered in quiet timidity, and gradually showed itself to be a great hedgehog, which was sitting there, still dreamy from its winter sleep, with tears on its nose. Miss Lossau became ill from fright. When the physician hastened to her the next morning, he found the lackeys and maid-servants collected in close conclave before her door. On the door was pasted a white placard, on which was to be read, in large characters, "Bettina von Lossau, Princely Court Spy." Again there was the strictest investigation, and again the culprit was not discovered.

(To be continued.)

CORRESPONDENCE.

MRS. M. M. E. ON MARRIAGE CONTRACTS.

To the Editor of THE OPEN COURT:—

A position which will not bear a thorough investigation is not worth defending, so I welcome the criticisms of Mrs. M. M. E., and of any one else who desires to take a hand. I think I can explain to the satisfaction of Mrs. M. M. E. some of the points she refers to.

I have not ignored the rights of others than the two principals in a case of separation of husband and wife, as Mrs. M. M. E. avers. I have insisted that the support of children should devolve on the father in such case, as in marriage. No matter where they might be, this rule would secure them from want at least, and leave the mother at liberty to support herself. Of course such law would be limited by the arrival at an age of self-support by children. This responsibility on the part of fathers is not only just, but it is natural. The man is primarily responsible for their existence, and if there is one form of responsibility more obligatory than another, it is this one. Support once secured, the chief obstacle to their finding a home away from the father, if that should be necessary, is removed. Remaining objections are trivial compared with the principal interests involved.

Mrs. M. M. E. further asserts that separation would fall more heavily on the woman than on the man. This would only be true in two of the five supposable cases, *i. e.*, where the man alone desires the separation, either from a good or from a bad woman. We will probably agree, that in the latter case the hardship is that which is found in the "way of the transgressor"; while in the former case many persons will agree with me that separation is the least of the two evils which confront the good woman whose husband wishes to leave her. If she is a good and congenial woman, the man who wishes to leave her must be an unworthy character. But that her "occupation is gone," as Mrs. M. M. E. declares, I deny; I should say that it was only opening with brighter prospects, and that her future would probably be far better than her past.

In my paper I did not devote more than a few lines to the question of support of the woman after separation. It is to my mind a self-evident proposition that an abandonment of the marriage relation between a man and woman, means an abandonment of all responsibilities growing out of that relation, so far as the principals are concerned. This is not only just from a business point of view (a view which I take with reluctance), but it is the only fair thing in its relation to marriage in general. The man will probably marry again, and his resources will be generally needed to support the new relation. He had certainly better devote his means to the support of a woman with whom he can live, than to that of one with whom he cannot live. A law requiring the support by the man of a woman from whom he is separated is unfair to the man and to some second woman, and is also unfair to society. It prevents the man from marrying, and so encourages irregularities; and it removes from the woman the necessity of adapting herself to the order of nature and of society, thus paying a premium for general cussedness. The advantage to be gained by bad women over the good under such an arrangement, is obvious. The law of absolute divorce, recognizing these facts, requires no financial consideration either way.

The question of the financial position of women in marriage has occupied a good deal of the thought of jurists. That a woman should be protected in her individual property rights is fair, in view of the risks arising from her possible marriage to a spendthrift. But it affords men an opportunity of escape from the payment of their debts, which results in a heavy tax on society. But some of the propositions which are put forth by certain agitators on this subject are preposterous. It is argued that a married woman is entitled to half the profits arising from a man's business, since she has lived with him and kept "his" house, and borne and brought up "his" children, etc., during this period. But there is no real relation between the two orders of facts, except that the support of the family reduces a man's financial ability by the amount which he spends in that way. The support of a family is not profitable financially. It is very profitable morally, and is as much so to the woman as to the man. Both are benefited by the relation, and each pays for what they get. The man pays in support; the woman in the pains and labors of her occupation. Both are treated about equally by the arrangement, so that the man's business successes or failures are a matter quite apart. It is said that a man's financial ability is always good, but that a woman's capital is exhausted as years pass by. So be it. Her support is sure if she is married and no proposition has been made by which she can be separated from her husband after the first five years except by her own consent, or her own bad conduct.

This materialistic view of the subject is not congenial to the writer, but simply flows from the consideration of its dark side. The bright side, which should be uppermost in everyone's mind, shows that the sex-interest is strong enough to furnish all the inducements to mutual admiration and consideration, and that if other feelings arise it is due to the fact that this interest is not in a healthy condition. We are directed to the conclusion that the real remedy for woman's wrongs, and woman's rights as well, is to give every person as full an opportunity of finding their true "double," as the safety of society will permit. But no one will ever find that "double" who does not first acknowledge in their own minds the actual character of the relation as shown by the laws of Nature, which lie at the basis of all human institutions.

E. D. COPE.

PHILADELPHIA, January, 1889.

NOTES.

We are in receipt of an interesting pamphlet by Edward Kibler, Esq., of Newark Ohio, entitled "Universality of two Temperaments."

The interesting essay, in the present number, entitled "Truth and Fiction," has been translated, with the sanction of Dr. Meyer from his work "*Kosmische Weltansichten*." Dr. M. Wilhelm Meyer is editor of *Himmel und Erde*, the astronomical journal recently started in Berlin.

The three latest publications of the Humboldt Library are reprints of: "Freedom in Science and Teaching," by Ernst Hæckel, with a preface by Prof. Huxley; "The Coming Slavery, The Sins of Legislators, and The Great Political Superstition," by Herbert Spencer; "Tropical Africa," by Henry Drummond. Price 15 Cents each. The Humboldt Publishing Company, 24 East Fourth Street, New York.

Dr. Edward Brooks of Philadelphia, the author of many excellent text-books on mathematics, mental philosophy, and kindred subjects, presents in his essay "Axioms the Basis of Mathematics" a criticism of our views as set forth in the editorial articles "Form and Formal Thought" (Nos. 64, 66, 67, and 69). Our answer "The Old and The New Mathematics" will appear in the issue of next week.

The opening article of the February *Century* is upon Gérôme,—chatty and instructive. The portraits of Mary, Queen of Scots, are interesting from the standpoint of the history of art. "Fairies and Druids of Ireland" appears in the series upon Erin, by Charles de Kay; the Ugrian element in the Irish race is discovered from the legends, annals, and traditions preserved in the history and folk-lore of the nation.